Digital Bibliotherapy as a Scalable Intervention for Suicidal Thoughts: A Randomized Controlled Trial

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Objective: Suicide is a major public health concern in the United States, but few effective and scalable interventions exist to help those with suicidal thoughts. We hypothesized that reading first-person narratives about working through suicidal thoughts would reduce the desire to die among adults and that this effect would be mediated by increased perceived shared experience and optimism. **Method:** Using a randomized waitlist-controlled trial, we tested the effect of digital narrative-based bibliotherapy among 528 adults visiting a social media platform dedicated to providing mental health support. Participants were randomized to either a treatment condition ($n = 266$), in which they read one suicide narrative per day for 14 days or to a waitlist control condition ($n = 262$). The primary outcome was a measure of desire to die assessed daily for the 14-day trial period and at 2-week follow-up. **Results:** Participants in the treatment condition reported lower desire to die than participants in the control condition during the 14-day trial period ($\beta = -0.26$, $p = .001$) and at 2-week follow-up ($t = -2.82$, $p = .005$). Increased perceived shared experience (indirect effect $b = -0.55$, $p < .001$) and optimism (indirect effect $b = -0.85$, $p < .001$) mediated the effect of treatment on desire to die. **Conclusions:** Digital narrative-based bibliotherapy may be an effective intervention for those at risk for suicide, and may work in part by increasing feelings of perceived shared experience and optimism. Future research is needed to test the generalizability of these results to other platforms, groups, and conditions.

What is the public health significance of this article?
This study demonstrates that reading user-generated narratives about experiences with and recovery from suicidal thoughts/behaviors may be an effective and scalable way to help people experiencing suicidal thoughts.

Keywords: suicide, randomized controlled trial, digital intervention, bibliotherapy

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In the United States, suicide is the 10th leading cause of death overall, and the second leading cause of death of individuals 15 to 44 (Centers for Disease Control and Prevention [CDC], 2021). Despite the enormity of this public health concern, scientific progress has not led to lasting reductions in the suicide rate, which in 2019 was nearly identical to that in the United States 100 years prior (CDC, 2015, 2021). Looking beyond the scope of traditional medicine and psychotherapy to identify novel treatments may improve our ability to ameliorate the problem of suicide.

Scholars have discussed the act of reading as an effective treatment for psychiatric concerns for centuries, and over the past 50 years this concept has been known as bibliotherapy (Weimerskirch, 1965). Often conducted with content relevant to the concerns of an individual who is suffering, bibliotherapy has numerous practical benefits when compared with traditional psychotherapies. It is low cost (Stip et al., 2020), brief (Evans et al., 1999; Stip et al., 2020), and can be conducted easily when face-to-face interventions are not feasible, such as during the current COVID-19 pandemic (Rahmat et al., 2021; Stip et al., 2020). Bibliotherapy is also shown to be beneficial for psychological distress, and these effects are generally long-lasting. For example, one meta-analysis of small-scale bibliotherapy trials for depression with various comparison conditions showed that bibliotherapy was associated with reductions in depression that persisted for 3 months to 3 years after the end of the trials (Gualano et al., 2017). Further, a separate multitrial study of structured bibliotherapy in which participants with anxiety read about self-help strategies found clinically significant reductions in anxiety symptoms at the conclusion of the bibliotherapy intervention and at 3-month follow-up (Wootton et al., 2018). Participants in this study also reported a high level of satisfaction with the bibliotherapy intervention (Wootton et al., 2018). In addition, another meta-analysis of small-scale bibliotherapy trials showed that guided bibliotherapy administered with varying levels of contact with psychotherapists was associated with equivalent reductions in depression and anxiety symptoms when compared with traditional psychotherapy (Cuijpers et al., 2010). However, due to the lack of large-scale randomized controlled trials examining the effectiveness of bibliotherapy delivered without clinician guidance, there may be additional unknown benefits to this practice, perhaps especially in easily scalable, online peer-to-peer modalities, as with the present study.

Narrative-based bibliotherapy, sometimes referred to as narrative therapy, is a form of bibliotherapy involving firsthand accounts of lived experience. Potential benefits of narrative-based bibliotherapy comprised of firsthand experiences with and/or recovery from suicidal thoughts and behavior (STB; including suicide attempts and suicidal thoughts/ideation[1]) align with the well-cited interpersonal theory of suicide. The interpersonal theory suggests that the unmet need for social connection (thwarted belongingness) and reduced optimism (hopelessness) are two psychological factors that lead people to think about ending their lives (Joiner, 2005; Rasmussen & Wingate, 2011; Van Orden et al., 2010). Reading firsthand narratives about others' experiences with suicide may improve social connectedness and optimism in at least three ways.

First, suicide narratives may lead to improvements in mental health and well-being by increasing connectedness to the experiences of a broader community, as perceived shared experience is shown to be a benefit of narrative-sharing more broadly (Bietti et al., 2019).

Increasing the perception that one's experiences are shared by others may be especially important for people with thoughts about suicide, who face stigma and social isolation that may further exacerbate distress (Näher et al., 2020; Oexle et al., 2018; Trout, 1980). Moreover, the perception of shared experience and having a larger and more well-connected social network was associated with lower psychological distress caused by the COVID-19 pandemic in a large sample of adults (Nitschke et al., 2021).

Second, narrative content is thought to convey experiential knowledge about subjects that are not often discussed openly, including suicide (Sheehan et al., 2019). By sharing their own experience with challenges, the author of the narrative can communicate specific challenges to be overcome (Gucciardi et al., 2016), identify gaps in the reader's knowledge (Sheehan et al., 2019), propose strategies that were beneficial (Niederkrotenthaler et al., 2016), and provide the reader with a plan for recovery (Berkley-Patton et al., 2009; Nguyen et al., 2017). In doing so, suicide narratives, especially those that showcase recovery-related behaviors (e.g., engaging in therapy), were shown by one meta-analysis to be associated with increased optimism about the possibility and process of recovery (Rennick-Egglestone et al., 2019). Indeed, inspiring optimism is shown to be a key benefit of narrative-sharing for individuals experiencing psychological distress (Berkley-Patton et al., 2009; Llewellyn-Beardsley et al., 2019). Moreover, identifying a plan for recovery that has proven successful for peers with shared lived experience may also increase one's self-reliance, further aiding in one's ability to manage distress (Rennick-Egglestone et al., 2019).

Third, and similarly, first-person narratives may help readers make sense of complex circumstances and emotions. Specifically, narrative-based bibliotherapy is theorized to support a reader's ability to verbalize their thoughts and feelings by improving their semantic representation of complex psychological processes (Glicken, 2009). With an enhanced ability to identify and express complex psychological processes, people may be more capable of concrete problem-solving, emotion regulation, and support seeking, which may improve both optimism and social connectedness (Rennick-Egglestone et al., 2019).

A growing number of studies have revealed therapeutic benefits of digital mental health resources for people at risk for suicide. Such resources include peer-to-peer internet support networks (Jaroszewski et al., 2019; Jiang et al., 2020), web-based individual psychotherapy platforms (Davies et al., 2020; Karin et al., 2021), and smartphone apps designed to improve one's sense of self-worth (Franklin et al., 2016). The internet may be a fruitful domain for the development of new suicide interventions as people with suicidal thoughts may be more likely to seek support online to avoid stigma (Berry et al., 2017), readily available methods for the detection of suicide-related discussions online have been validated (Franz et al., 2020), and digital interventions can reach a broader population more easily than traditional psychotherapies,

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[1] Suicide attempt refers to a nonfatal act performed with the intent to die as a result. Suicidal thoughts, often termed suicidal ideation, refer thoughts about taking one's own life, and these dramatically outnumber suicide attempts. In 2020, more than 10 times as many Americans thought about than attempted suicide (Substance Abuse and Mental Health Services Administration, 2021). Nevertheless, suicidal thoughts are one of the strongest predictors of future suicide attempt, even though most people who think about suicide do not act on these thoughts (Franklin et al., 2016).

including those unable or unwilling to attend in-person appointments (Perrin et al., 2020; Yuen et al., 2012). In short, society is in need of effective suicide interventions that are low cost, engaging, and highly scalable. Internet-based resources seem poised to host such interventions.

Social media platforms enable users to discuss their experiences with mental health difficulties and allow other users to read, comment on, and share these stories with others at no monetary cost. People with suicidal thoughts, behaviors, and related self-injurious concerns tend to use social media platforms as a way to communicate and find information about these concerns (Eichenberg, 2008; Franz et al., 2020; Mitchell & Ybarra, 2007; Niederkrotenthaler et al., 2016). The content posted on these platforms provides an opportunity to explore whether this form of digital narrative-based bibliotherapy can benefit people struggling with suicidal thoughts, especially in light of evidence suggesting that social media content can have both helpful and harmful effects on people at risk for suicide (Robinson et al., 2016; Swedo et al., 2021; Weinstein et al., 2021). Nevertheless, several recent studies have provided preliminary evidence that digital narrative-based bibliotherapies could be beneficial for suicidal thoughts (Bietti et al., 2019; Booker & Dunsmore, 2017; Gucciardi et al., 2016; Niederkrotenthaler et al., 2016). However, many of these studies were qualitative in nature, most examined small sample sizes, and none to our knowledge have employed a randomized controlled design to systematically examine the influence of narrative-based bibliotherapy on suicidal thoughts.

Here, we aimed to fill this gap in our knowledge by testing whether reading user-generated stories about struggles with and recovery from STB posted to a digital social media platform leads to a reduction in the suicidal thoughts of at-risk individuals. We hypothesized that such stories are beneficial for people experiencing suicidal thoughts by increasing perceived shared experience and feelings of optimism.

Method

Participants

Participants were recruited from an online platform dedicated to supporting those who face health challenges (https://www.The Mighty.com). Users can subscribe to content posted within subcommunities organized by specific challenges. Website moderators placed a "popup" advertisement for this study on pages that featured content related to suicide. Interested users completed an online screening questionnaire that assessed age, race/ethnicity, history of STB (using a modified self-report version of the Self Injurious Thoughts and Behaviors Interview; Nock et al., 2007), and current intent to act on suicidal thoughts. Inclusion criteria were: Age 18+ years, English fluency, presence of suicidal thoughts in the past year (assessed using a single item asking "have you had suicidal thoughts in the past 12 months?"), and current likelihood of acting on suicidal thoughts (assessed using a single item "based on how you are doing now, how likely is it that you will act on your suicidal thoughts?") of 6 or lower on a 10-point scale. Those with higher suicidal intent received a message encouraging them to contact the National Suicide Prevention Lifeline at 1-800-273-8355. An a priori power estimate suggested that a sample of at least 500 participants with a

50% response rate (completing seven out of 14 surveys) would provide sufficient statistical power $(1 - \beta > .80)$ to detect medium effects or larger, and lower power $(1 - \beta = .60)$ for small effects. Two 14-day recruitment periods were required to achieve the target sample size, and each participant began the trial procedures immediately after their respective recruitment period. In total, we screened 1,742 users, of which 864 (49.6%) met study inclusion criteria. Forty-seven individuals (2.6%) were screened out due to high suicidal intent. A final sample of 528 (30.3%) participants qualified for the study, provided informed consent, and completed at least one survey during the trial period (see Figure 1). Participants on average completed 8.7 $(SD = 4.6)$ surveys during the trial.

Trial Design

Five hundred twenty-eight participants were randomized into either the treatment $(n = 266)$ or waitlist control $(n = 262)$ condition and provided data. As described in greater detail below, during the 14-day trial period participants in the treatment condition read one suicide narrative per day and responded to daily surveys assessing constructs of interest, while participants in the control condition completed daily surveys only. A total of 293, treatment condition $n = 150$ [56.4%]; control condition $n = 143$ [54.6%], participants responded to a 2-week follow-up survey. After the follow-up period, participants originally assigned to the waitlist control condition received the treatment, i.e., crossover; $n = 194$ [74.0%] participants provided data. Baseline group-level characteristics are presented in Table 1. Participants were compensated by being entered into a raffle for one of two $250 checks. Participants were eligible for the raffle if they completed at least 75% of the daily surveys, and each eligible participant was given one entry into the raffle for each survey response they provided. All trial procedures were approved by the Harvard University Institutional Review Board (IRB19-0843).

Study Outcomes

The primary study outcome was self-reported desire to die over the course of the 14-day trial period. The secondary outcome was desire to die at 2-week follow-up. All participants were sent a brief three-item survey each day during the 14-day trial period. The survey items were:

> Right now, how much do you feel: (a) like you want to die? (b) connected to other people (like you are *not* the only one with your problems)? and (c) optimistic about your future (like your current concerns might get better)?

Participants in the treatment condition also responded to an additional item, "how much do you feel like you can identify with the author of this story?" Items were presented in random order at each assessment and rated on a Likert-type scale ranging from 0 (*not at all*) to 10 (*definitely*). Participants in the treatment condition completed the survey before and after reading the story, and the poststory scores were used in between-groups analyses. The same three-item survey was sent to all participants 2 weeks after the conclusion of the 14-day trial period. The survey items were intended to be clear and brief to reduce participant burden, maximize face validity, and increase the overall response rate.

Figure 1
Consolidated Standards of Reporting Trials (CONSORT) 2010 Flow Diagram
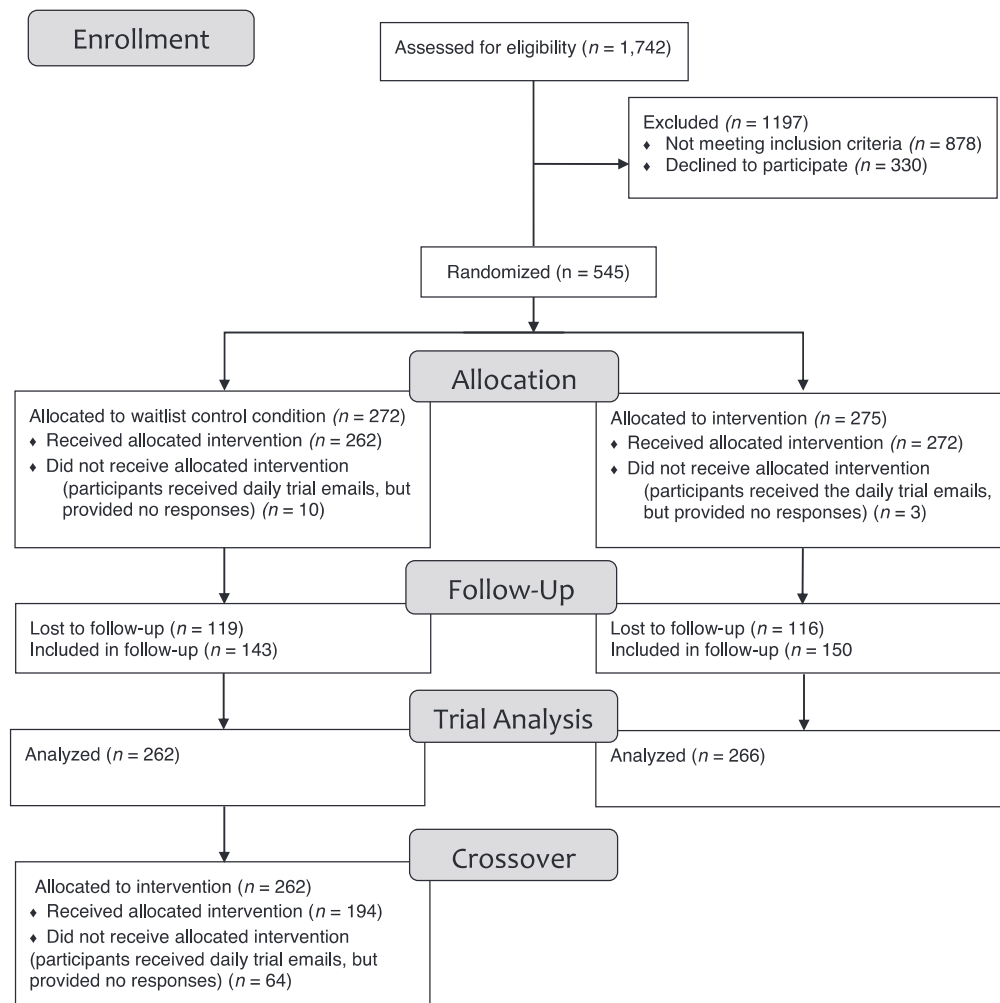
Treatment

The treatment consisted of reading a brief first-person narrative about struggling with suicidal thoughts each day for the 14-day trial period. The set of 14 narratives was selected based on pilot research suggesting that these narratives were associated with reductions in suicidal thoughts (Stubbing et al., 2022). Further, we also selected these narratives because they described struggling with STB in a seemingly relatable way (e.g., "feeling this way is common") and/or included a positive conclusion (e.g., the author discussed recovery), which were features we assumed would increase the perception of shared experience and optimism by participants. Additional details of the narrative features are described in a separate article (Stubbing et al., 2022). An example narrative that was used in this study and illustrates these features is included as Supplemental Figure S1.

Data Analysis

We tested four a priori hypotheses. First, we predicted that participants receiving the digital narrative-based bibliotherapy intervention (treatment condition) would report lower desire to die over the course of the trial period than those on the waitlist (control condition). Second, we predicted that the effect of the treatment would be maintained for the 2-week follow-up period. Third, we predicted that participants assigned to the treatment condition who completed more days of the trial would report lower desire to die (i.e., dose–response effect). Fourth, we predicted that reductions in the desire to die for those who received the digital narrative-based bibliotherapy intervention (treatment condition) would be mediated by increased perceptions of shared experiences and increased feelings of optimism.

We tested the effect of the digital narrative-based bibliotherapy intervention on participants' desire to die (Hypothesis 1; effect of digital narrative-based bibliotherapy intervention) using a multilevel model with participant-level random intercepts, and condition (treatment vs. control) as a fixed effect. We then tested the interaction between condition and survey day on desire to die by including a condition-by-treatment day interaction term, and we probed the interaction using simple slopes analysis. Also, we controlled for history of suicidal thoughts by including average intensity of

Table 1
Participant Characteristics

Characteristic	Control (*n* = 262) N (%)/M (SD)	Treatment (*n* = 266) N (%)/M (SD)	Test (*df*)	*p* value	Effect size
Age *N* (%)			χ^2 (5) = 7.6	.178	Cliff's Δ = 0.03
18–20	3 (0.5)	3 (0.5)			
21–29	33 (6.3)	27 (5.1)			
30–39	60 (11.4)	55 (10.4)			
40–49	69 (13.1)	74 (14.0)			
50–59	52 (9.8)	78 (14.8)			
60 or older	43 (8.1)	30 (5.7)			
Race/ethnicity *N* (%)			χ^2 (10) = 10.8	.375	Cliff's Δ = 0.01
African American or Black	11 (2.1)	7 (1.3)			
American Indian or Alaskan Native	0 (0.0)	3 (0.5)			
Asian	2 (0.4)	3 (0.5)			
Asian Indian	5 (0.1)	2 (0.3)			
Hispanic or Latino	9 (1.7)	4 (0.7)			
Middle Eastern or North African	2 (0.3)	2 (0.3)			
Native Hawaiian or Pacific Islander	0 (0.0)	0 (0.0)			
White or Caucasian	214 (40.5)	221 (42.0)			
Other	18 (3.4)	23 (4.3)			
Gender *N* (%)			χ^2 (3) = 11.5	0.009	Cliff's Δ = 0.06
Female	215 (40.7)	236 (44.7)			
Male	39 (7.3)	18 (3.4)			
Nonbinary/third gender	7 (1.3)	13 (2.4)			
Prefer not to say	1 (0.1)	0 (0.0)			
Suicidal thoughts *M* (SD)					
Intensity of suicidal thoughts (past month)	2.3 (1.1)	2.0 (1.1)	*t*(527.0) = 2.3	.023	Cohen's *d* = 0.19
Frequency of suicidal thoughts (past month)	2.6 (1.2)	2.2 (1.1)	*t*(519.81) = 3.9	<.001	Cohen's *d* = 0.34
Likelihood of acting on suicidal thoughts	2.3 (1.5)	1.9 (1.3)	*t*(508.3) = 2.9	.004	Cohen's *d* = 0.25

Note. All values were obtained by a screening questionnaire administered at the time of study enrollment. Control and treatment groups were not uniform in size because fewer participants in the control group initiated the trial.

suicidal thoughts in the past month, frequency of suicidal thoughts in the past month, and current intent to act on suicidal thoughts in separate models as participant-level fixed effects, alongside participant-level random intercepts and condition (treatment vs. control) as a fixed effect. We tested whether participants originally assigned to the waitlist control condition reported decreases in desire to die during the time they received the treatment (crossover effect) using a multilevel model with participant-level random intercepts and survey day as a fixed effect. We tested condition differences in desire to die at the 2-week follow-up point (Hypothesis 2; maintenance of treatment effect at 2-week follow-up) using a *t* test, as desire to die was approximately normally distributed (skewness = 0.58; kurtosis = 2.23) and homogeneity of variance was satisfied (ratio of variances = 1.15). Nevertheless, we also used a Mann–Whitney *U* test to confirm the treatment effect at follow-up. We tested whether the number of days of participation was associated with lower desire to die for participants in the treatment condition (Hypothesis 3; dose–response effect) using a multilevel model with participant-level random intercepts and the interaction between condition and days of participation as participant-level fixed effects. We then used simple slopes to probe this interaction. We used mediation analysis to examine whether reduced desire to die in the treatment condition, relative to the control condition, was mediated by differences in perceived shared experience and optimism (Hypothesis 4; proposed treatment mediators). All analyses were performed using R Version 4 (R Core Team, 2021). We used the *lme4* package for multilevel modeling (Bates et al., 2014) and the *lavaan* package for mediation analyses (Rosseel, 2012).

We used an intent-to-treat approach for all analyses, which provides a conservative estimate of treatment efficacy (McCoy, 2017). More specifically, for the analyses of the effect of the digital narrative-based bibliotherapy intervention, dose–response effect, and proposed treatment mediators, we included all participants who provided at least one rating of the main outcome of interest, desire to die, during the trial period (Figure 1). In our analysis of crossover effects, we included the subset of participants from the trial analysis sample who provided any crossover data. In our analysis of maintenance of treatment at 2-week follow-up, we included the subset of participants from the trial sample who provided a follow-up rating of desire to die.

Transparency and Openness

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study, and we follow Journal Article Reporting Standards (JARS; Kazak, 2018). All data, analysis code, and research materials are available upon request. This study's methods and hypotheses were registered with ClinicalTrials .gov (identifier: NCT05351645) after data were collected. We have no previously published or in-press works stemming from the data set analyzed here.

Results

Effect of the Digital Bibliotherapy Intervention

Participants assigned to the treatment condition, who read suicide narratives each day during the 14-day trial period, reported

significantly lower desire to die during the trial than those assigned to the waitlist control condition ($\beta = -0.26$, CI [$-0.40, -0.11$], $p = .001$; Figure 2). We also found a significant interaction between condition and trial day in their effect on desire to die during the trial period ($\beta = -0.06$, CI [$-0.09, -0.02$], $p = .002$). Simple slopes analysis indicated that control participants on the waitlist experienced an increase in desire to die over the course of the trial ($\beta = 0.06$, CI [$0.04, 0.08$], $p < .001$), whereas those receiving the treatment did not ($\beta = 0.00$, CI [$-0.02, 0.03$], $p = .745$).

We observed similar findings when participants originally on the waitlist received the treatment (crossover $n = 194$). Specifically, when on the waitlist, participants reported an increase in desire to die (as noted above), but they reported no change in their desire to die when they subsequently received the 14-day intervention ($\beta = 0.00$, CI [$-0.02, 0.02$], $p = .969$), replicating the effect of the narrative-based bibliotherapy intervention on those initially assigned to the treatment condition.

Despite randomization, participants assigned to the control condition reported significantly higher scores on measures of suicidal thoughts at baseline, as shown in Table 1. We therefore controlled for these measures in separate analyses while reexamining the effectiveness of the treatment. In each of these analyses, we found that participants in the treatment condition reported significantly lower desire to die relative to those in the control condition, even when controlling for prior suicidal thoughts (Table 2).

Maintenance of Treatment Effect at 2-Week Follow-Up

Participants assigned to the treatment condition reported significantly lower desire to die at the 2-week follow-up assessment ($M = 3.33$, $SD = 2.25$; Figure 3) than did those in the control condition ($M = 4.10$, $SD = 2.42$; $t = -2.82$, CI [$0.23, 1.31$] $p = .005$, $d = 0.33$,

CI [$0.10, 0.56$]). A Mann–Whitney U test of the difference in median desire to die between the control condition ($Mdn = 4$, interquartile range [IQR] = 4) and treatment condition ($Mdn = 3$, IQR = 4) was also significant ($W = 12{,}762$, $p = .004$).

Dose–Response Effect

Results revealed the hypothesized dose–response effect for those in the treatment condition but not the control condition (Figure 4). In other words, we found a significant interaction between days of participation and condition ($\beta = -0.12$, CI [$-0.22, -0.01$], $p = .028$). We used simple slopes analysis to confirm that the dose–response effect was specific to the treatment condition, and found that the association between number of days of participation and desire to die was more negative for those in the treatment condition ($\beta = -0.05$, CI [$-0.13, 0.02$] $p = .162$) than for those in the control condition ($\beta = 0.06$, CI [$-0.01, 0.14$], $p = 0.091$). However, neither slope was significant for one condition in isolation.

Proposed Treatment Mediators

We found that those in the treatment condition reported higher feelings of perceived shared experience ($\beta = 0.63$, CI [$0.49, 0.77$] $p < .001$) and optimism ($\beta = 0.43$, CI [$0.28, 0.57$], $p < .001$) during the trial relative to those in the control condition on average. As with the primary outcome, desire to die, condition differences in perceived shared experience and optimism during the trial were driven by decreases for those in the control condition (perceived shared experience $\beta = -0.07$, CI [$-0.09, -0.05$] $p < .001$; optimism $\beta = -0.08$, CI [$-0.10, -0.03$] $p < .001$), while those in the treatment condition reported no change (perceived shared experience $\beta = -0.01$, CI [$-0.03, 0.01$] $p = .293$; optimism $\beta = -0.01$, CI [$-0.04, 0.01$] $p = .371$).

Figure 2
Self-Reported Desire to Die Across the 14-Day Trial Period
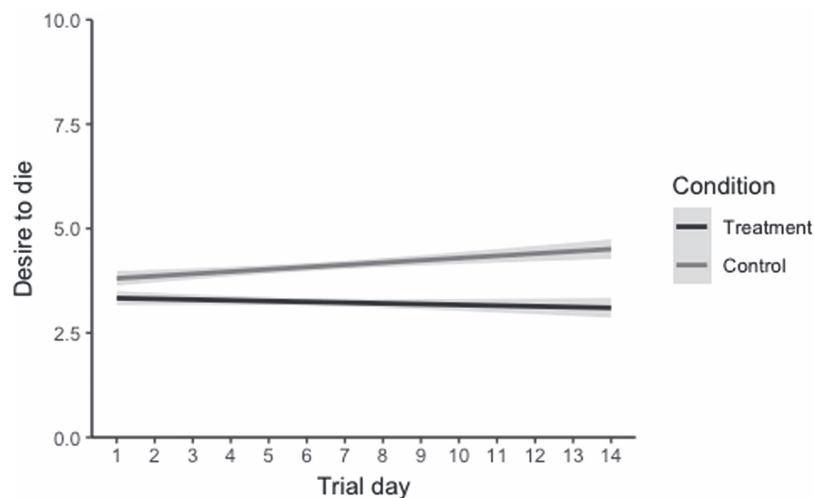
Note. This is a within-participants plot of desire to die and trial day. Participants can be represented multiple times, because the dependent measure, desire to die, is averaged across all participants who responded on each trial day, and the number of participants responding on each given trial day was not uniform.

Table 2
Effect of Treatment on Desire to Die Controlling for Suicidal Thought History

Independent variable	Std. β	95% CI	p value
Condition (treatment vs. control)	−0.23	[−0.36, −0.10]	.001
Intensity of suicidal thoughts (past month)	0.39	[0.32, 0.45]	<.001
Condition (treatment vs. control)	−0.16	[−0.29, −0.04]	.010
Frequency of suicidal thoughts (past month)	0.43	[0.37, 0.50]	<.001
Condition (treatment vs. control)	−0.21	[−0.34, −0.08]	.002
Likelihood of acting on suicidal thoughts	0.37	[0.30, 0.43]	<.001

Note. CI = confidence interval; Std. = Standardized.

We next found that higher average levels of both perceived shared experience (indirect effect $b = −0.55$, $z = 16.104$, $p < .001$; total effect $b = −0.85$, $z = 11.44$, $p < .001$) and optimism (indirect effect $b = −0.48$, $z = 13.71$, $p < .001$; total effect $b = −0.85$, $z = 11.44$, $p < .001$) mediated the association between condition (treatment vs. control) and desire to die. Finally, participants originally assigned to the control condition, who reported increases in perceived shared experience and optimism (as reported above) while they were on the waitlist, subsequently reported no change in perceived shared experience ($\beta = 0.00$, CI [−0.03, 0.0] $p = .648$) nor optimism ($\beta = −0.02$, CI [−0.04, 0.00] $p = .102$) when they were provided with the intervention, similar to those originally assigned to the treatment condition.

Discussion

We tested the effectiveness of a digital narrative-based bibliotherapy intervention among a large sample of adults with suicidal thoughts. Using a randomized controlled trial, we found that people assigned to read one suicide-related narrative per day for 14 days reported significantly less desire to die than those assigned to a waitlist control condition. These effects were mediated by increased perceived shared experience and optimism, which were common themes in these narratives. This is the first study to experimentally test the effects of digital narrative-based bibliotherapy for suicidal individuals using a randomized controlled trial. Below, we provide further commentary on our results, as well as future directions for this line of research.

Suicidal thinking is a complex problem that is difficult to treat (Fox et al., 2020). Our first result, that reading daily suicide-related narratives was associated with a lower desire to die during a 14-day trial period, provides evidence that digital narrative-based bibliotherapy can help people with suicidal thoughts. Importantly, the therapeutic effects of this digital narrative bibliotherapy intervention were evident 2 weeks after the initial 14-day trial. Although prior research has shown that bibliotherapy can benefit those who engage in self-injurious behaviors (Evans et al., 1999), our results are the first to demonstrate that user-generated digital narrative content may be helpful for people experiencing suicidal thoughts using a randomized controlled trial. Like other digital suicide interventions, the intervention described in this study may have important benefits over more traditional psychotherapy, including that this intervention is free and widely available, easily scalable to reach many at-risk individuals, and can be

Figure 3
Maintenance of the Treatment Effect at 2-Week Follow-Up
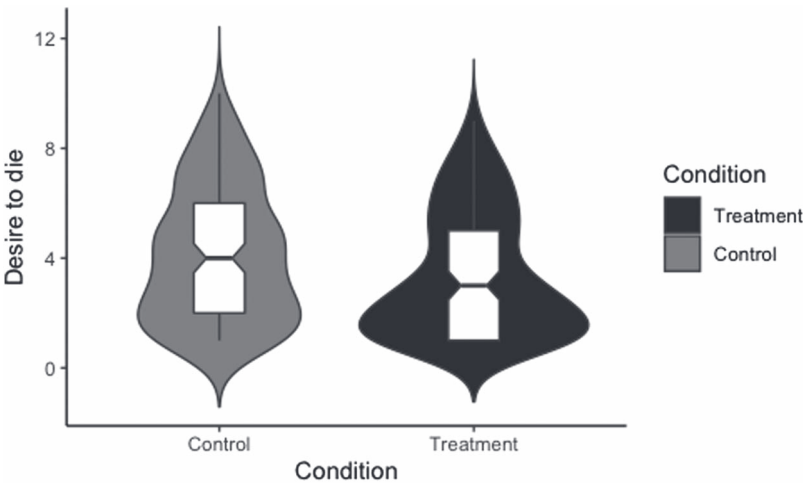
Note. The violin plot displays the difference in the distributions of desire to die for the control and treatment conditions at the 2-week follow-up assessment point. The inset boxplots display the median with 95% confidence interval, interquartile range, and total range of each distribution.

Figure 4
Self-Reported Desire to Die Across Differing Levels of Participation (Dose–Response Effect)
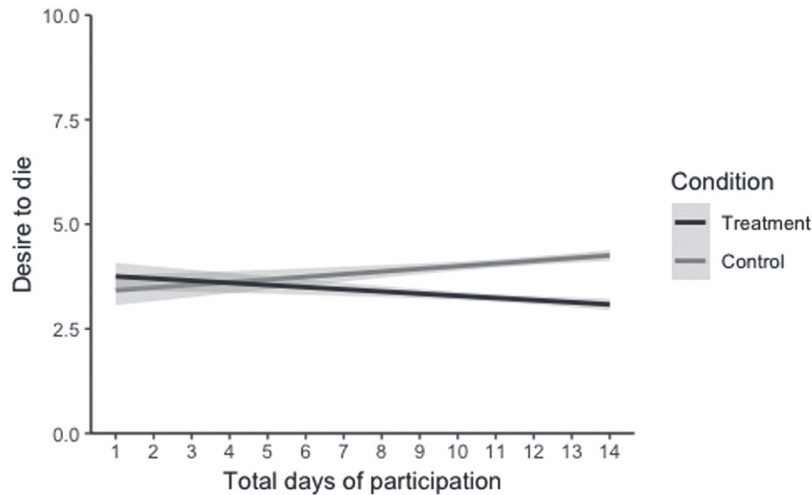
Note. This is a between-participants plot of desire to die and days of participation. Each participant is represented only once.

completed at the convenience of the user. However, unlike prior efficacious digital interventions for people contemplating suicide that have utilized strategies such as texting (Berrouiguet et al., 2018) or internet-administered psychotherapy (Wilks et al., 2018), narrative-based bibliotherapy is low-burden for the patient and it requires little-to-no therapist or administrator involvement. Furthermore, our results indicate that some types of user-generated narrative content, which exists in abundance online, can hold therapeutic value for people who are struggling with suicidal thoughts. The benefits of such content hosted on an online supportive community also accord with prior research showing that psychotherapy focused on building social support can help reduce suicidal thinking (Heisel et al., 2009). Future research should explore the benefit of this digital narrative-based intervention relative to more traditional psychotherapy, and also as an adjunctive treatment to help maintain the benefits of psychotherapy, which has previously been explored in prior studies of bibliotherapy (Adams & Pitre, 2000; Akhouri, 2018).

Although we observed a significant effect of digital narrative-based bibliotherapy, differences in self-reported desire to die between those in the treatment and control conditions were driven by increases in the desire to die among those in the waitlist control condition, rather than by reductions among those in the treatment condition. One possible explanation for this finding is that participants may have come to this site seeking help for increases in their suicidal thinking, and barring users in the control condition from accessing this therapeutic resource prevented them from getting one form of support (although increases in desire to die were small). If this were the case, it would suggest that, for users of The Mighty and similar types of sites/platforms, the content hosted may help maintain their well-being and protect against increasing suicidal desires. Importantly, participants originally assigned to the waitlist condition no longer experienced an increase in desire to die when subsequently provided with the intervention. This finding provides

additional evidence for this maintenance effect. Future research should examine whether the therapeutic effects observed here generalize to those not seeking to access narratives about suicide, as well as whether other factors might predict which kinds of individual characteristics might predict who responds best to digital bibliotherapies of this type.

We also found that the association between the number of days an individual participated in the study and their self-rated desire to die (i.e., dose–response effect) depended on the condition to which an individual was assigned. Visual inspection of this interaction in Figure 4 suggests that the dose–response effect was specific to the treatment condition, although we were unable to confirm this effect using simple slopes analysis, likely because of lower statistical power when examining the treatment and control condition separately. Nevertheless, the therapeutic benefits of digital narrative-based bibliotherapy for suicide may require continued engagement over longer periods of time. Our test of the effectiveness of this intervention lasted only 1 month (i.e., 14-day trial period and 2-week follow-up), which limits the inferences we can draw about the longer term impact of this intervention. Given prior research on the persistence of suicidal thoughts over time (Nock et al., 2018), such a treatment length is likely insufficient to prevent the return of suicidal thoughts. Future studies should test the feasibility and acceptability of longer digital narrative-based bibliotherapy interventions as well as the length of their therapeutic impact.

Finally, we found that the therapeutic benefit of reading suicide-related narratives was mediated by two putative mechanisms of change: increased perceived shared experience and increased feelings of optimism. A considerable body of prior research implicates both lower perceived shared experience (i.e., social isolation/thwarted belongingness) and lower optimism (i.e., hopelessness) as prospective risk factors for STBs (Franklin et al., 2017; Joiner, 2005; Van Orden et al., 2010). Thus, our results add to existing

evidence that targeting these risk factors provides benefits to people at risk for suicide (Heisel et al., 2009; Rudd et al., 2015), and they also highlight digital support communities as platforms that can target these risk factors as mechanisms of change. Self-injurious individuals engage with online communities at a higher rate than age-matched peers (Tseng & Yang, 2015), and so clarifying specific ways that online communities can offer support to suicidal users helps pave the way to develop future interventions targeting these same mechanisms, and can also guide the efforts of digital support community content moderators.

Limitations

These results should be interpreted in light of several additional limitations. First, the waitlist control condition may have precluded our ability to determine whether effects of this narrative-based treatment were specific to the suicide content of the narratives. However, the waitlist was chosen as a control condition due to the lack of prior literature indicating whether narrative bibliotherapy can help people experiencing suicidal thoughts, a context in which prior work suggests that a waitlist control condition is appropriate (Freedland et al., 2019; Gold et al., 2017). Future studies can utilize a more active comparison condition, such as narrative content about emotional difficulties that does not mention STBs, to investigate whether narrative content about suicide, specifically, is an important component of digital bibliotherapy for suicidal thoughts.

Second, the majority of participants in this study identified as White females. This sample reflects the user base of the platform that hosted this trial, but it limits our ability to generalize these findings to broader populations. Future studies can increase sample diversity by using recruitment strategies that target a broader range of demographic characteristics and by using stratified sampling. This may be a particularly important future direction, as digital bibliotherapy has the potential to increase access to evidence-based care for those who experience barriers to traditional mental health care.

Third, it is possible that participants in the control condition could have accessed the platform's content using alternative login credentials, or without logging in at all, which is permitted by the platform. Although some measures can be taken to prevent this access, such as the consented tracking of IP addresses (Pozzar et al., 2020), it is challenging to prevent users from accessing these platforms entirely. Similarly, participants may have had previously read the suicide-related narratives used in this intervention trial. Each of these possibilities would have weakened the effect of the intervention relative to the control condition but are noteworthy limitations.

Fourth, all participants in this study were existing users of this platform, limiting the inferences we can draw about the generalizability of these findings to those not already seeking out narratives about suicide. It is also possible that this selection bias could have enhanced treatment effects and reduced attrition, given that participants were motivated to read about mental health content online. Future studies should seek to recruit participants who vary in their familiarity with online support communities, perhaps by advertising both online and offline for a digital bibliotherapy study.

Fifth, we assessed the trial outcome, desire to die, and proposed treatment mediators, perceived shared experience and optimism, using single items. We chose this approach to reduce participant

burden and, relatedly, to ensure face validity of complex constructs that can be hard to understand or differentiate for research participants (Millner et al., 2017). Nevertheless, drawbacks of single-item assessments are low reliability and low sensitivity (Millner et al., 2015), although some evidence suggests that single-item assessments often show high agreement with longer scales assessing the same construct (Verster et al., 2021).

Finally, the narratives analyzed in this trial were (a) hosted on a platform that strives to provide beneficial content and (b) selected by the authors because of their relatable and/or positive messages to readers. These realities limit the generalizability of our findings to other, less well-moderated social media platforms, and to suicide narratives that may not contain the same beneficial features as those analyzed here. For example, some evidence suggests that certain types of communication about suicide could be associated with increased risk for STBs (Swedo et al., 2021). Future research can directly examine the specific content of suicide narratives to determine which types of content are most beneficial for reducing suicidal thoughts, increasing perceived shared experiences, and increasing hope about the future.

Future Directions

Three additional future directions are noteworthy. First, narrative content is common on digital social media platforms. Future research can investigate applications of digital narrative-based bibliotherapy for many other types of problematic or risky behaviors, such as substance abuse and disordered eating, which, like suicide, are associated with reduced social connectedness (Bonar et al., 2021; Mason et al., 2016) and reduced optimism (Bolland, 2003; Ward & Hay, 2015). Similarly, studies can also test whether increased social connectedness and optimism are forces of positive change on other social media platforms. Second, the first-person nature of user-generated content may have been a crucial for helping people with suicidal thoughts, but we were unable to test that hypothesis directly. Future studies can help identify whether first-person suicide narratives are a particularly compelling resource for those who are struggling by comparing these with other, more traditional forms of bibliotherapy, such as reading a self-help treatment guide. Third, in this study participants did not communicate directly with the authors of bibliotherapeutic posts. Future investigations of digital narrative-based bibliotherapy may benefit from examining natural interactions between original authors and readers, which have been observed to provide mental health benefits to both parties (Harris et al., 2009; Kral, 2006; Maloney-Krichmar & Preece, 2002; Naslund et al., 2016; Niederkrotenthaler et al., 2016).

Conclusions

Although prior research has shown that digital interventions can help suicidal individuals by reducing suicidal thoughts (Wilks et al., 2018) and self-harming behaviors (Franklin et al., 2016), this is the first randomized controlled trial of a digital narrative-based bibliotherapy for those with suicidal thoughts, as well as the first application of narrative-based bibliotherapy where content was generated organically by users. Our results demonstrate that people at risk for suicide who read selected suicide-related narratives posted on a digital social media platform reported a lower

desire to die during a 2-week study period than individuals who did not read these stories. We hope that this low cost, scalable intervention will be employed more widely to help people struggling with suicide as well as other mental health concerns and that this study will inspire further research on digital and bibliotherapy interventions for those at risk for suicide.

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